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Client-focused investment management: the use of scenario-based modelling

The fact that an investor's cash flow requirement or liability forms the basis for any investment strategy is a fact often overlooked or misunderstood during the investment process.

For a defined benefit pension fund, this cash flow is usually a stream of salary-linked pension payments to retired ex-employees. An insurance company operating with-profits business may need to make a series of guaranteed payments to policyholders at specified future dates. A 60 year-old retail investor may use their accumulated fund to generate an annual income of 5% of initial capital over a retirement period of 20 years. A 30-year old might regard their investments as a 'rainy day' fund.

There are many other simple examples, but the important common factor is that these retail and institutional investments all incorporate some defined cash flow or liability.

Volatility: uses and abuses...

Given that the cash flow requirement or liability is integral to any client-focused investment strategy, it seems strange that most investment processes continue to rely on risk measures such as volatility.

Volatility and tracking error are used to assess the risk a fund manager has taken in order to generate return or 'alpha' within a portfolio. Since cash flows are usually outside the fund manager's control, these 'time-weighted' risk measures have been deliberately designed to remove the impact of the size and timing of cash flows. However, the use of volatility and tracking error has been extended into many aspects of the investment process, including asset allocation, product design and fund rating.

Whilst volatility or tracking error may be useful tools for assessing the past performance of an active fund manager, ignoring the cash flow or investment objective is liable to be inappropriate for the purpose of designing client-focused investment solutions. We can look at an example...

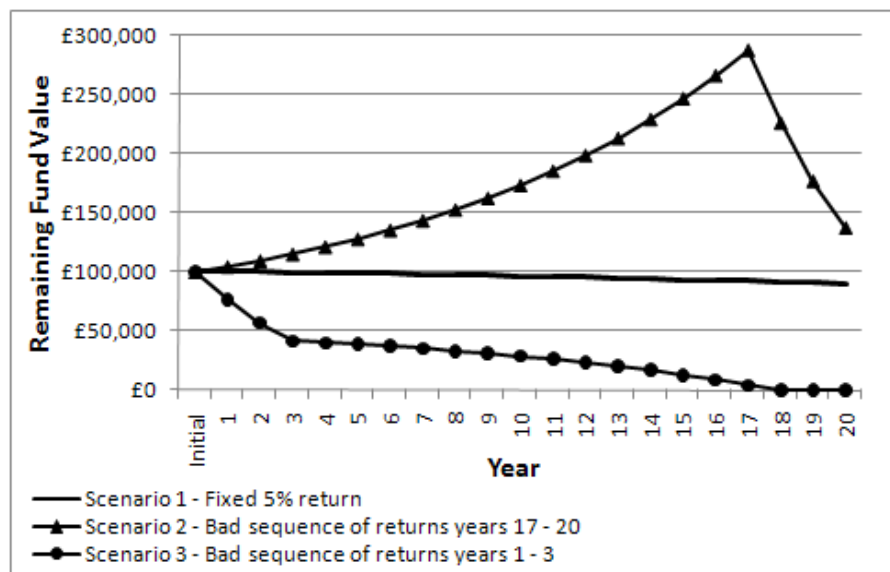
Client cash flows create *path-dependent* risks

Let's go back to our 60-year old retirement investor: we will assume he has accumulated investments of £100,000 and wants to draw down an income of £5,000 at the start of each year. Assuming the investments generate a *fixed* annual return of 5% (the lower rate of return in a standard FSA deterministic pension projection), then these will comfortably meet his income requirements – in fact, there would be around £90,000 remaining after 20 years of withdrawals. But no investment fund returns exactly 5% *every* year. In the following chart, we compare the fixed 5% return with two alternative 20-year return scenarios.

- + **Scenario 1:** Fixed 5% annual return (the standard 'lower rate' FSA deterministic illustration)
- + **Scenario 2:** 10% return for first 17 years, 20% fall for last 3 years (bad return sequence in last 3 years)
- + **Scenario 3:** 20% fall for first 3 years, 10% return for last 17 years (bad return sequence in first 3 years)

The key point is that the 'time-weighted' return (the total return over the 20 year period) is the same in all three scenarios - exactly 5%. The difference between the three scenarios is the *sequence* of returns.

In the absence of any cash flows, these three scenarios would produce exactly the same outcome: the initial fund of £100,000 would grow to £260,000 after 20 years. However, the fact that the investor is drawing an annual income of £5,000 means the sequence of returns has a dramatic impact on the outcome. Whilst the income can be comfortably supported for 20 years under a fixed 'deterministic' return, under Scenario 3 the fund runs out completely after 17 years.



There are a few important points to take away from this example:

- + When selecting an investment strategy or product to fit the client's risk profile, we should use a measure of risk which accounts for the fact that the outcome depends on the sequence of returns.
- + The total return over the period – e.g. whether it is 5%, 7% or 9% - is less important.
- + Customers and advisors relying on time-weighted risk measures or deterministic return scenarios are likely to significantly underestimate the risk in a given investment strategy

Conventional time-weighted risk measures like volatility or tracking error are not useful for designing or selecting an appropriate investment strategy given this type of cash flow profile.

A fund rating paradox

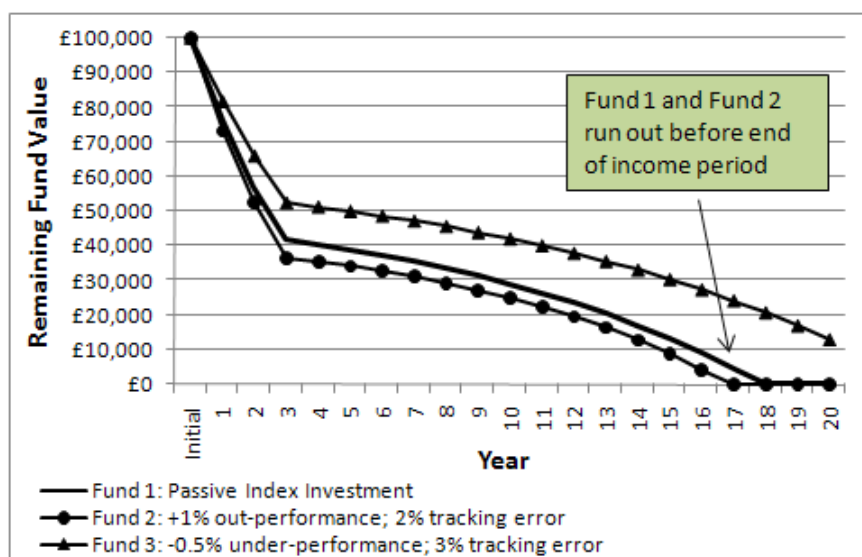
Having used a scenario-based approach to select an investment strategy which matches the client's investment objective and risk profile, fund ratings may be used to help select funds. Generally, these fund ratings will use historic returns to estimate various metrics such as expected return, volatility, risk-adjusted return, and for active funds a tracking error vs. a defined benchmark.

Without thinking too hard about why, let's assume our retirement investor had decided to invest 100% of his assets in 'UK Equities'. Suppose he used the following fund rating information to inform his selection of one of the following three UK Equity funds:

	Benchmark Index Volatility	Performance vs. Benchmark (Historic)	Tracking Error	Rating
Fund 1: Passive UK Equity Index Tracker	20%	0%	0%	n/a
Fund 2: Managed UK Equity (High Beta, Momentum) Significantly out-performs in bull markets and moderately underperforms in bear markets	20%	+1% pa	2% pa	***
Fund 3: Managed UK Equity (Low Beta, Defensive) Moderately underperforms in bull markets and moderately outperforms in bear markets	20%	-0.5% pa	3% pa	*

Based on this standard fund rating information, this looks like a 'no-brainer': Fund 2 is out-performing the index and has a lower tracking error. Fund 3 is underperforming the index and has a higher tracking error. Faced with this information, the ratings are intuitive and most investors would immediately rule out Fund 3.

But going back to our previous analysis, we saw that this client's cash flow outcome was most susceptible to a bad sequence of market returns over the first few years of the investment term – Scenario 3. In this scenario, Fund 2 will under-perform over the first few years, whilst the Defensive Fund 3 actually delivers higher (less bad!) returns. The outcomes for the investor are shown in the following chart. Given the investment objective, Fund 3 is likely to be a better choice than either Fund 1 or Fund 2. In this case, it is clear that relying on the fund rating information alone would have led to the worst possible choice of fund! Taking into account the cashflow or investment objective is critical to selecting an appropriate fund.



Client focused investment solutions: The application of scenario-based asset models

In practice, scenario-based asset liability modelling allows us to calculate risk measures that take into account different possible sequences of returns when designing client-focused investment solutions. There are two methods for creating economic scenarios:

	Description	Advantages	Disadvantages
Historic Simulation	Illustrates how a particular investment strategy or product would have performed under particular period of historic market returns.	Intuitive: results can be related to familiar historic events.	Experience shows that past experience is not a good guide to the future, particularly when it comes to understanding the risk of extreme events (the 'Black Swan').
Stochastic Modelling	Rather than using historic data, we use economic model to generate future scenarios, and assign weights or probabilities to these scenarios.	As well as capturing historic behaviour, the model can generate future scenarios that have not been observed in the past.	Developing a robust stochastic model requires significant investment in specialist skills. This task is usually outsourced to dedicated model providers such as Barrie & Hibbert.

Going forward... implications for investment management

This challenge of client-focused investment is coming into starker focus as packaged investment solutions such as model portfolios and target date funds are becoming increasingly popular. These propositions are targeted at particular customer needs and as a consequence embed some element of advice. The marketing message is moving away from pure performance to one of robust governance.

From a regulatory perspective, the FSA has repeatedly emphasised the need to ensure products are designed in accordance with customer needs through its increasingly robust enforcement of the Treating Customers Fairly.

Whilst regulation of the UK retail market seems to be acting to improve customer outcomes, the ongoing CESR consultation regarding the use of a synthetic risk indicator for UCITs funds seems to be more concerned with ensuring the risk rating process is a simple 'tick-box' for the asset manager. Based on current CESR drafting, investment providers would be compelled to risk rate all funds using a measure that ignores the customer's investment objective! Watch this space – but this illustrates why manufacturers of 'client-focused' investment solutions will need to continue to work hard to communicate the benefits in their products.

Scenario based models offer a reliable tool for designing investment products that do what they say on the tin. Over the last 12 months, we have seen the market waking up to this challenge - many of our partners and clients have committed significant resource to embedding scenario-based modelling into their product design and communication processes. However, those organisations represent a small number of market leaders - there is still a long way to go before the majority of UK investors will experience truly client-focused investment products.

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